

Claims

- [c1] 1. A method of forming a high thermally conductive and high strength article, comprising the steps of:
providing a polymer base matrix of, by volume, between approximately 30 and 70 percent;
providing a first filler of high modulus PITCH-based carbon material, by volume, between approximately 15 and 47 percent; the first filler having an aspect ratio of at least 10:1;
providing a second filler of PAN-based carbon material, by volume, between approximately 10 and 35 percent, the second filler having an aspect ratio of at least 10:1;
mixing the polymer base matrix, the first filler and the second filler together into a molding composition; and
net-shape injection molding the molding composition into an article having a thermal conductivity of at least 4 W/m°K and a tensile strength of at least 15 ksi.
- [c2] 2. The method of Claim 1, further comprising the step of:
providing a third filler of thermally conductive material, by volume, between 1 and 10 percent, said third filler having an aspect ratio of less than 5:1; and

mixing the third filler with the polymer base matrix, the first filler and the second filler into the molding composition.

- [c3] 3. The method of Claim 1, wherein said polymer base matrix is a polycarbonate material.
- [c4] 4. The method of Claim 1, wherein said polymer base matrix is a liquid crystal polymer material.
- [c5] 5. The method of Claim 1, wherein said first filler is of a fiber configuration.
- [c6] 6. The method of Claim 1, wherein said second filler is of a fiber configuration.
- [c7] 7. The method of Claim 1, wherein said first filler is of a flake configuration.
- [c8] 8. The method of Claim 1, wherein said second filler is of a flake configuration.
- [c9] 9. The method of Claim 1, wherein said second third filler is spheroid in shape.
- [c10] 10. The method of Claim 1, wherein said third filler is of a grain configuration.
- [c11] 11. The method of Claim 1, wherein said third filler is selected from the group consisting of boron nitride, alu-

minum, alumina, copper, magnesium and brass.